CLAIMS:

1. In an IPG comprising an IPG housing containing electronic circuitry and an IPG connector header having a header bore for receiving and making connection between a lead connector assembly of an implantable medical lead comprising a plurality of lead connector elements arranged in-line and separated by lead insulator elements, an improved IPG connector header comprising:

a connector header base having an attachment surface shaped to be attached with a surface of the IPG housing, a header bore entrance into which the lead connector assembly is inserted to make the connection, and a cavity axially aligned with the header bore entrance;

a first plurality of electrically conductive, header connector elements each having a connector element bore sized to receive and make electrical contact with a lead connector element;

a second plurality of electrically insulating, flexible fluid seals each having a seal bore sized to receive a lead insulator element;

interlocking means disposed between each adjoining one of the first plurality of header connector elements and the second plurality of fluid seals for interlocking the first plurality of header connector elements with the second plurality of fluid seals in a stack of alternating header connector elements and fluid seals to electrically insulate the header connector elements from one another with the connector element bores in axial alignment with the fluid seal bores to define a stack bore and stack axis; and

means for maintaining the stack within the recess of the connector header base with the stack bore axially aligned with the header bore entrance to define the header bore for receiving the lead connector assembly with header connector elements in electrical contact with the lead connector elements and fluid seals in contact with lead insulator elements.

2. The IPG connector header of Claim 1, wherein the interlocking means further comprises coupling means extending from each header connector

element parallel to the stack axis and into the adjoining fluid seal to mechanically interlock the header connector elements and fluid seals.

3. The IPG connector header of Claim 2, wherein the coupling means mechanically reinforces the fluid seals against forces tending to collapse or distort the fluid seals.

4. The IPG connector header of Claim 1, wherein the first plurality of header connector elements is formed of a sidewall extending between first and second end walls forming an interior channel, and further comprises a continuous coil spring fitted into and retained by the interior channel, whereby turns of the coil spring bear against lead connector elements inserted into the header connector element bore.

5. The IPG connector header of Claim 1, wherein the seal bore of at least one of the second plurality of fluid seals is formed with a sealing ring that is sized to frictionally engage a lead insulator element inserted into the fluid seal bore

6. The IPG connector header of Claim 1, further comprising a setscrew connector element supporting a setscrew aligned radially with a connector block bore, and further interlocking means disposed between the setscrew connector element and at least one of the second plurality of fluid seals for interlocking the setscrew connector element into the stack with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

7. The IPG connector header of Claim 6, wherein the further interlocking means further comprises coupling means extending from the setscrew connector element parallel to the stack axis and into the adjoining fluid seal to mechanically interlock the setscrew connector element with the header connector elements and fluid seals.

8. The IPG connector header of Claim 7, wherein the further coupling means mechanically reinforces the fluid seals against forces tending to collapse or distort the fluid seals.

9. The IPG connector header of Claim 6, wherein the connector block bore is dimensioned to receive a lead connector element when the lead connector assembly is inserted into the header, and the setscrew is adapted to be tightened against the lead connector element.

10. The IPG connector header of Claim 1, wherein the second plurality of fluid seals exceeds the first plurality of electrical connector elements whereby end fluid seals are fixed at each end of the stack by the interlocking means, and further comprising reinforcing means fitted to the end fluid seals to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

11. In an IPG comprising an IPG housing and an IPG connector header having a header bore for receiving and making connection between a lead connector assembly of an implantable medical lead comprising a plurality of lead connector elements arranged in-line and separated by lead insulator elements, an improved IPG connector header comprising:

a connector header base having an attachment surface shaped to be attached with a surface of the IPG housing, a header bore entrance into which the lead connector assembly is inserted to make the connection, and a cavity axially aligned with the header bore entrance;

a first plurality of electrically conductive, header connector elements each having a connector element bore sized to receive and make electrical contact with a lead connector element, each header connector element formed of a sidewall extending between first and second end walls and having a first male flange extending away from the first end wall and a second connector annular male flange extending away from the second end wall;

a second plurality of electrically insulating, flexible fluid seals each having a seal bore sized to receive a lead insulator element, each fluid seal formed of a sidewall extending between first and second end walls and having a first female groove formed into the first end wall and a second female groove formed into a second end wall;

wherein predetermined ones of the first and second flanges of the first plurality of header connector elements are inserted into the first and second grooves of the second plurality of fluid seals to interlock the first plurality of header connector elements with the second plurality of fluid seals in a stack with the connector element bores in axial alignment with the fluid seal bores to define a stack axis and stack bore; and

means for maintaining the stack within the recess of the connector header base with the stack bore axially aligned with the header bore entrance to define the header bore for receiving the lead connector assembly with header connector elements in electrical contact with the lead connector elements and fluid seals in contact with lead insulator elements.

12. The IPG connector header of Claim 11, wherein the interlocking grooves and flanges are annular and are formed to extend parallel to the stack axis to mechanically interlock the header connector elements and fluid seals.

13. The IPG connector header of Claim 11, wherein the interlocking grooves and flanges are annular and are formed to extend parallel to the stack axis to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

14. The IPG connector header of Claim 11, wherein the first plurality of header connector elements is formed of a sidewall extending between first and second end walls forming an interior channel, and further comprises a continuous coil spring fitted into and retained by the interior channel, whereby

turns of the coil spring bear against lead connector elements inserted into the header connector element bore.

15. The IPG connector header of Claim 11, wherein the seal bore of at least one of the second plurality of fluid seals is formed with a sealing ring that is sized to frictionally engage a lead insulator element inserted into the fluid seal bore

16. The IPG connector header of Claim 11, further comprising a setscrew connector element supporting a setscrew aligned radially with a connector block bore and formed with a flange extending from the setscrew connector element into a mating groove of at least one of the second plurality of fluid seals for interlocking the setscrew connector element into the stack with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

17. The IPG connector header of Claim 16, wherein the connector block bore is dimensioned to receive a lead connector element when the lead connector assembly is inserted into the header, and the setscrew is adapted to be tightened against the lead connector element.

18. The IPG connector header of Claim 11, further comprising a setscrew connector element supporting a setscrew aligned radially with a connector block bore and formed with a first flange extending from a first side of the setscrew connector element into a mating groove of a first one of the second plurality of fluid seals and with a second flange extending from a second side of the setscrew connector element into a mating groove of a second one of the second plurality of fluid seal for interlocking the setscrew connector element into the stack with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

19. The IPG connector header of Claim 18, wherein the connector block bore is dimensioned to receive a lead connector element when the lead connector assembly is inserted into the header, and the setscrew is adapted to be tightened against the lead connector element.

20. The IPG connector header of Claim 11, wherein the second plurality of fluid seals exceeds the first plurality of electrical connector elements whereby end fluid seals are fixed at each end of the stack by the interlocking flanges and grooves exhibiting empty end grooves in each end fluid seal, and further comprising a reinforcing flange fitted to end grooves of the end fluid seals to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

21. In an IPG comprising an IPG housing containing electronic circuitry and an IPG connector header having a header bore for receiving and making connection between a lead connector assembly of an implantable medical lead comprising a plurality of lead connector elements arranged in-line and separated by lead insulator elements, a method of fabricating an improved IPG connector header comprising:

providing a connector header base having an attachment surface shaped to be attached with a surface of the IPG housing, a header bore entrance into which the lead connector assembly is inserted to make the connection, and a cavity axially aligned with the header bore entrance;

interlocking a first plurality of electrically conductive, header connector elements each having a connector element bore sized to receive and make electrical contact with a lead connector element with a second plurality of electrically insulating, flexible fluid seals each having a seal bore sized to receive a lead insulator element into a stack of alternating header connector elements and fluid seals that electrically insulate the header connector elements from one another with the connector element bores in axial alignment with the fluid seal bores to define a stack bore and stack axis; and

fixing the stack within the recess of the connector header base with the stack bore axially aligned with the header bore entrance to define the header bore for receiving the lead connector assembly with header connector elements in electrical contact with the lead connector elements and fluid seals in contact with lead insulator elements.

22. The method of Claim 21, wherein the interlocking means further comprises inserting coupling members extending from each header connector element parallel to the stack axis into the adjoining fluid seal to mechanically interlock the header connector elements and fluid seals.

23. The method of Claim 22, wherein the coupling members mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

24. The method of Claim 21, wherein each of the first plurality of header connector elements is formed of a sidewall extending between first and second end walls forming an interior channel, and further comprising the step of fitting a continuous coil spring fitted into the interior channel, whereby turns of the coil spring bear against lead connector elements inserted into the header connector element bore.

25. The method of Claim 21, wherein the seal bore of at least one of the second plurality of fluid seals is formed with a sealing ring that is sized to frictionally engage a lead insulator element inserted into the fluid seal bore

26. The method of Claim 21, further comprising the step of interlocking a setscrew connector element supporting a setscrew aligned radially with a connector block bore with at least one of the second plurality of fluid seals with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

27. The method of Claim 26, further comprising the step of attaching electrical conductors to the header connector elements and the setscrew connector element, the connector ribbons extending to the attachment surface of the connector header base.

28. The method of Claim 21, further comprising the step of attaching electrical conductors to the header connector elements, the connector ribbons extending to the attachment surface of the connector header base.

29. The method of Claim 21, wherein the second plurality of fluid seals exceeds the first plurality of electrical connector elements whereby end fluid seals are fixed at each end of the stack in the interlocking step, and further comprising reinforcing the end fluid seals to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

30. The method of Claim 21, wherein each of the first plurality of header connector elements is formed of a tubular part comprising a sidewall extending from a first end wall and a second part comprising a second end wall and a continuous coil spring and further comprising the steps of:

inserting the continuous coil spring against the sidewall and first end wall; and

attaching the second part to the first part to form an interior channel capturing the continuous coil spring in the interior channel, whereby turns of the coil spring bear against lead connector elements inserted into the header connector element bore.

31. In an IPG comprising an IPG housing containing electronic circuitry and an IPG connector header having a header bore for receiving and making connection between a lead connector assembly of an implantable medical lead comprising a plurality of lead connector elements arranged in-line and separated by lead insulator elements, a method of fabricating an improved IPG connector header comprising:

providing a connector header base having an attachment surface shaped to be attached with a surface of the IPG housing, a header bore entrance into which the lead connector assembly is inserted to make the connection, and a cavity axially aligned with the header bore entrance;

providing a first plurality of electrically conductive, header connector elements each having a connector element bore sized to receive and make electrical contact with a lead connector element, each header connector element formed of a sidewall extending between first and second end walls and having a first male flange extending away from the first end wall and a second connector annular male flange extending away from the second end wall;

providing a second plurality of electrically insulating, flexible fluid seals each having a seal bore sized to receive a lead insulator element, each fluid seal formed of a sidewall extending between first and second end walls and having a first female groove formed into the first end wall and a second female groove formed into a second end wall;

inserting predetermined ones of the first and second flanges of the first plurality of header connector elements into the first and second grooves of the second plurality of fluid seals to interlock the first plurality of header connector elements with the second plurality of fluid seals in a stack with the connector element bores in axial alignment with the fluid seal bores to define a stack axis and stack bore; and

maintaining the stack within the recess of the connector header base with the stack bore axially aligned with the header bore entrance to define the header bore for receiving the lead connector assembly with header connector elements in electrical contact with the lead connector elements and fluid seals in contact with lead insulator elements.

32. The method of Claim 31, wherein the interlocking grooves and flanges are annular and are formed to extend parallel to the stack axis to mechanically interlock the header connector elements and fluid seals.

33. The method of Claim 31, wherein the interlocking grooves and flanges are annular and are formed to extend parallel to the stack axis to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

34. The method of Claim 31, wherein the first plurality of header connector elements is formed of a sidewall extending between first and second end walls forming an interior channel, and further comprising the step of fitting a continuous coil spring fitted into the interior channel, whereby turns of the coil spring bear against lead connector elements inserted into the header connector element bore.

35. The method of Claim 31, wherein the seal bore of at least one of the second plurality of fluid seals is formed with a sealing ring that is sized to frictionally engage a lead insulator element inserted into the fluid seal bore

36. The method of Claim 31, further comprising:

providing a setscrew connector element supporting a setscrew aligned radially with a connector block bore and formed with a connector block flange extending from the setscrew connector element; and

inserting the connector block flange into a mating groove of at least one of the second plurality of fluid seals for interlocking the setscrew connector element into the stack with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

37. The method of Claim 36, wherein the connector block bore is dimensioned to receive a lead connector element when the lead connector assembly is inserted into the header, and the setscrew is adapted to be tightened against the lead connector element.

38. The method of Claim 31, further comprising:

providing a setscrew connector element supporting a setscrew aligned radially with a connector block bore and formed with a first connector block flange extending from a first side of the setscrew connector element and a second connector block flange extending from a second side of the setscrew connector element; and

inserting the first and second connector block flanges into mating grooves of first and second fluid seals to interlock the setscrew connector element into the stack with the connector block bore in axial alignment with the fluid seal bores and the connector element bores to define the stack bore and stack axis.

39. The method of Claim 38, wherein the connector block bore is dimensioned to receive a lead connector element when the lead connector assembly is inserted into the header, and the setscrew is adapted to be tightened against the lead connector element.

40. The method of Claim 39, further comprising the step of attaching electrical conductors to the header connector elements and the setscrew connector element, the electrical conductors extending to the attachment surface of the connector header base.

41. The method of Claim 38, wherein the second plurality of fluid seals exceeds the first plurality of electrical connector elements whereby end fluid seals are fixed at each end of the stack in the interlocking step having empty end grooves, and further comprising:

fitting a reinforcing flange into the end grooves of the end fluid seals to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

42. The method of Claim 31, wherein the second plurality of fluid seals exceeds the first plurality of electrical connector elements whereby end fluid

seals are fixed at each end of the stack in the interlocking step having empty end grooves, and further comprising:

fitting a reinforcing flange into the end grooves of the end fluid seals to mechanically reinforce the fluid seals against forces tending to collapse or distort the fluid seals.

43. The method of Claim 31, further comprising the step of attaching electrical conductors to the header connector elements, the electrical conductors extending to the attachment surface of the connector header base.

44. The method of Claim 31, wherein each of the first plurality of header connector elements is formed of a tubular part comprising a sidewall extending from a first end wall and a second part comprising a second end wall and a continuous coil spring and further comprising the steps of:

inserting the continuous coil spring against the sidewall and first end wall; and

attaching the second part to the first part to form an interior channel capturing the continuous coil spring in the interior channel, whereby turns of the coil spring bear against lead connector elements inserted into the header connector element bore.